

DOCUMENT RESUME

ED 038 606

AC 006 866

AUTHOR Douglass, Stephen A.
TITLE Telewriter; A Survey of Attitudes, Information and Implications.
PUB DATE Sep 69
NOTE 27p.

EDRS PRICE MF-\$0.25 HC-\$1.45
DESCRIPTORS Academic Performance, Bibliographies, Evaluation, *Facsimile Transmission, Feasibility Studies, Glossaries, Lecture, Overhead Projectors, Pilot Projects, *Teaching Techniques, *Telephone Communication Systems, *Telephone Instruction, *University Extension

ABSTRACT

A research review was undertaken to assess the effectiveness of telewriting (the transmission of graphics and of speech through special telephone circuits) as a teaching technique or device in university extension. This involved a survey of pilot projects in Quebec, Iowa, Illinois, and elsewhere, as well as the need for innovations in adult education media. It was concluded that telewriting can save much time and money, but that its effectiveness depends heavily on user attitudes, teacher preparation, and adequate service and facilities. (The document includes a short glossary, four tables, a map, and 20 references.) (LY)

A 0006866

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE
PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS
STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION
POSITION OR POLICY.

TELEWRITER

A SURVEY OF ATTITUDES, INFORMATION AND IMPLICATIONS

A Report

Presented To

The Department of Extension Education
University of Missouri-Columbia

In Fulfillment of Requirements

For A Special Problem, Extension Education 400

By

Stephen A. Douglass
September 1, 1969

ED038606

DEFINITION OF TERMS

TELEWRITER - - - - - As used in this paper is a medium, mechanically composed of two telephone line circuits. One of the circuits is composed of the electro-writer transceiver and overhead projector for transmitting the graphics and the other circuit is the audio line for voice transmission.

ELECTROWRITER - - - - - This consists of two electronic handwriting devices, an electrowriter transmitter and an electrowriter receiver.

OVERHEAD PROJECTOR - - An apparatus which is mechanical and is used to enlarge and project visual images transmitted by the electrowriter onto a large screen.

VERB - - - - - Trade name (Victor Electrowriter Remote Blackboard) sometimes referred to as (Visual Electronic Remote Blackboard).

TELESCRIPT - - - - - Terminology used in Quebec - means the same as telewriter.

INTRODUCTION

The Land-Grant University system initiated a concept over a century ago that focused its effort toward the problem of the individual. This has been a function of extension and continuing education as a part of the University Land-Grant system. In the early days, it was primarily Agriculture oriented, however in our present day society it is concerned with all facets of the individual and group needs.

The specific needs of society have changed over the years. Our society has become increasingly complex. It now requires not only individual discussion but group decisions and group actions.

Adjusting to the changes in today's world involves, for educators, not only the writing of new curriculum and exploring through experimentation new methods to better achieve the goals of the educational program, but the discovery of more effective ways of disseminating this information and the bringing of specialists in a variety of fields to all persons interested in education regardless of location of the source of information or the people involved.

In considering extension and continuing education, it would appear the University of Missouri has an obligation to all the people of Missouri. If this assumption is true, the acceptance of the faculty of academic service to all the people in the

state would of necessity be true. The problem then arises as to how the University can actually provide service to people over the entire state. The vast number of educational needs cannot entirely be met through traditional methods and techniques of teaching which tax limited human and financial resources. More economical and readily available techniques must be developed and used if this ever increasing audience is to be served.

The use of multi-media instruction could be of value in assisting the academic people in fulfilling this obligation. Perhaps a beginning could be greater use of the telewriter.

There is no magic in telewriter. It is simply an electronic device, a two-way channel of communications. It has many advantages and certain shortcomings.

The value of the telewriter as a teaching tool has been successfully demonstrated. Telewriter is simply a media, it is not designed nor intended to replace the classroom teacher nor to substitute for all activities.¹

Two way instantaneous discussion is effected and the professor's notes appear on a screen in front of the student

¹Jimmie B. Dyer, "Telewriter Educational System", Barry County Cooperative Project, (June, 1969).

as the instructor writes them. This is accomplished by two telephone circuits. One line is used for the transmission of the graphics via the Visual Electrowriter Remote Blackboard (VERB). The screen size can be up to 109" x 158" according to audience number, room size and light intensity. The other line is used for the audio transmission which can be used for two-way discussion.

²Victor Educational Services Institute, "VERB University Extension Courses", Chicago, Illinois, (1968).

REVIEW OF RESEARCH

Blackwood and Trent³ in their study to compare the relative effectiveness of face-to-face and remote teaching (telecture) in communicating educational information to an adult audience found there was no major difference in the amount learned under the two teaching situations. The two groups were about evenly divided as shown in this table:

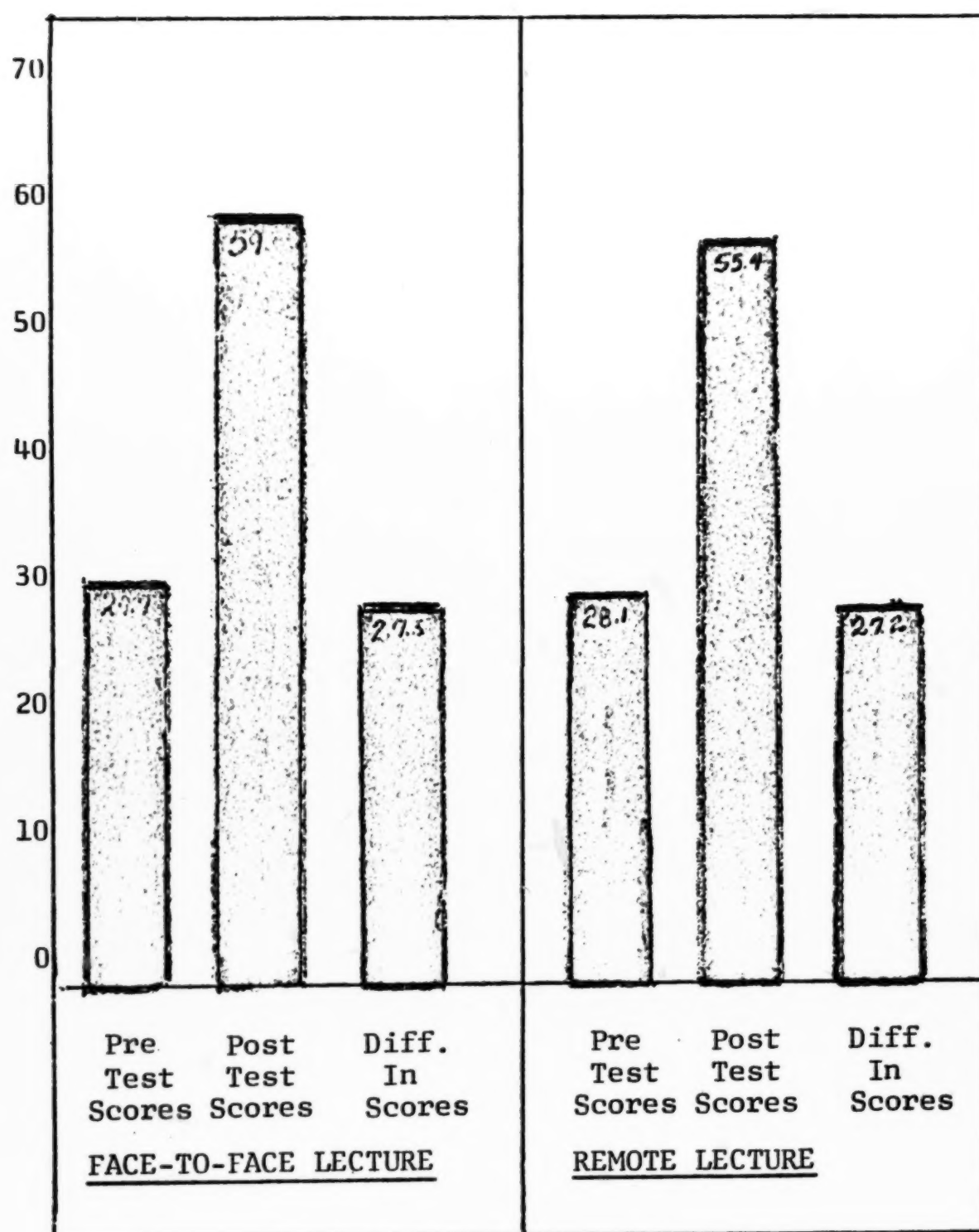
TABLE I
NUMBER OF PARTICIPANTS BY TECHNIQUE

<u>Technique</u>	<u>Number of Participants</u>
Face-to-Face	34
Remote	37
Total - - -	<u>71</u>

A standard illustrated lecture was presented by specialist to control group. The experimental group received the same lecture by the same specialist simultaneously via telephone line.

³Helen Blackwood and Curtis Trent, "A Comparison of the Effectiveness of Face-to-Face and Remote Teaching in Communicating Educational Information to Adults", Extension Bulletin No. 4, Kansas State, Manhattan, (November 1968).

TABLE II



A COMPARISON OF THE EFFECTIVENESS OF FACE-TO-FACE AND REMOTE TEACHING IN COMMUNICATING EDUCATIONAL INFORMATION TO ADULTS.

The mean scores of the two groups on the pre-test were almost identical. The t test showed there was no significant difference in the level of knowledge of the subject possessed by the two groups.

The mean post-test of both groups were higher than the pre-test scores. The t test showed there was no significant difference in the level of accumulated knowledge. The t test showed there was no significant difference in the amount learned (difference between the pre-test and post-test mean scores) by the two groups.

It probably could be concluded that either of the two teaching techniques could be used and a similar amount of learning could be expected.

The largest VERB (Visual Electronic Remote Blackboard) system exists in the Province of Quebec⁴. It has 60 receiving stations and in some cases the service has been in use 12 hours a day, five days a week for as long as 22 weeks. The Province of Quebec is divided into 64 educational regions having 10 or 12 schools.

The Communications Plan is to have eventually each region

⁴Victor Comptometer Corporation, "VERB/Largest System", Attached Brochures, Chicago, Illinois, (June, 1968).

install one educational control console with 50 terminals for switching on a private line basis VERB transmission to the regional classrooms. This will enable transmission of slow scan TV and facsimile in the future.

There are very few actual research studies completed on the use of telewriter as an educational media but the following data taken from a study completed in Canada agrees with some studies in the United States.

The study on teaching by Telescript⁵ (Telewriter) in the Province of Quebec was made on the following assumption:

Students following a course by means of Telescript should not obtain a lower grade than those following the same course using traditional methods.

The test groups were taught by means of the telescript equipment two hours a week over a nine-week period. Each of the two courses were given by one teacher to all the students in the test group. The reference groups were taught by their usual professor according to the traditional method. At school Number One, the teacher who taught the test group by way of telescript equally taught the test group according to the traditional method.

⁵Ibid.

Examinations were given at the end of these courses. A certain number of the preliminary examination items were included in these examinations. The choice of the items was made according to a survey conducted by the McGill University Data Processing Centre.⁶

TABLE III

Averages obtained by the test groups and the reference groups in the final Statistics Examination.

Test (1)			Reference (2)			Difference		Significance	
Schools	N	A	s	N	A	s	M(1) - M(2)	f	
1	56	73.52	13.65	61	74.45	10.85	-0.93	.402	N.S.
2	30	83.17	9.60	36	80.33	9.85	+2.84	1.163	N.S.
3	21	79.38	11.70	27	82.74	9.40	-3.36	1.050	N.S.
4	24	75.42	9.60	23	75.47	12.47	-0.05	.015	N.S.
5	24	82.00	7.35	-	-	-	-	-	-
Total:	155	77.74	11.95	147	77.57	11.15	0.17	.127	N.S.

Table III shows that differences in averages between the test groups and the reference groups in the final Statistics examination in each school and on the whole were not significant.

⁶ Ibid

TABLE IV

Averages obtained by the test groups
and the reference groups at the final
examination in Measures in Education.

Test (1) Schools	N	Reference		(2) N	A	Difference		Significance	
		A	s			s	M(1) - M(2)	f	
1	62	69.58	13.55	57	71.91	12.33	-2.33	.974	N.S.
2	32	75.43	12.08	33	74.12	12.06	+1.35	.652	N.S.
3	21	77.47	8.45	20	75.50	13.70	+1.97	.538	N.S.
4	23	66.13	13.72	24	65.12	12.20	+1.01	.261	N.S.
5	23	77.68	10.90	-	-	-	-	-	-
Total:	161	72.47	13.35	134	71.77	12.90	+.70	.457	N.S.

This table indicates that the average
difference at the final examination in
Measures in Education were not signifi-
cant.

Discussion

The fact that there was no significant difference in the examination of the two subjects proves that the physical presence of the professor is not a must in teaching subjects such as Statistics and Measures in Education.

At the risk of hurting some teachers' professional pride, it seems reasonable to conclude that the face, appearance and other physical characteristics are less important in teaching than the excellence of the preparation and teaching of the course itself. Moreover, the fact that the teacher-student dialogue can be kept up explains the fact that no difference was evident in

the final examinations. In other words, teaching by telescript is very similar to the traditional method on the important points.

Conclusion:

In the light of this first experimental study, it is possible to confirm the following assumption:

Teaching by telescript is as efficient as by the traditional method. Subsequent experiments should enable us to discover all the advantages of this new teaching technique⁷.

In another pilot program known as the Northwest Iowa Telewriter Project⁸ and financed by the Ford Foundation, a program was designed to bring up to the minute information about the teaching of Modern Mathematics to elementary teachers. Seven receiving centers were used. More than 500 people took part in the eight week training project which utilized the telewriter. A key feature of this was its low cost (1/30 to 1/50) compared to closed circuit television of a similar nature.

Citing another favorable factor as: "the telewriter permits both questions and answers and the responses clue the

⁷Ibid

⁸Northwest Iowa Telewriter Project, Arthur C. Anderson, Evaluation of the Project, Area District IV-A, Des Moines, Iowa, (1965).

instructor to speed up or slow down." "You never know the audience response with closed circuit television and best of all we used one instructor to reach 500 teachers at one time."⁹

Another successful activity of the project was an eight week Modern Mathematic Seminar for Adults. The professor aided by especially prepared handouts, lectured to a weekly average of 1570 adults.

At the University of Illinois, J. W. Seyler¹⁰, Academic Coordinator Extension in Engineering, says, "We have been working with this equipment long enough with sufficient numbers of people to be convinced that it is an efficient and effective tool to use in the education of adults."

The Univex Net¹¹ links ten Illinois communities into a network or loop for teaching by telewriter.

Since this program began over fifty instructors have taught over the system. They have found that some teachers are better than others in using the equipment but none have been found to be totally unable to adjust. Most of the teachers make

⁹Richard Morton, "Telewriter Opens New Doors To In Service Training", Educational Bulletin, Volume 35, Number 3, (November, 1965) pp 1-3.

¹⁰J. W. Seyler, Letter dated July 11, 1969 and report enclosed.

¹¹University of Illinois, "Multi-Media In The Division Of University Extension, University of Illinois", Report, (1969) p 1.

the point that the extra preparation required to use the Electro-writer, with its small writing area, has resulted in better teaching for their on-campus students.¹²

The only area where the multi-media students appear to be consistently and significantly different than his on-campus counter part is in withdrawals.¹³

One writer, Mellinger,¹⁴ says, "The lack of face-to-face contact with the instructor is no problem for the student, because the courses are highly advanced and small numbers give ample opportunity for close interaction. The telewriting equipment also helps him explain complex ideas more clearly."

In a study completed by Boswell and Mocker¹⁵ the results showed no significant difference among the groups and the students response to the teacher-class evaluation failed to show systematic difference among the groups.

¹²Ibid

¹³Ibid

¹⁴William Mellinger, "Lear Engineers Use Telelecture Link" Communication News, (September 1967).

¹⁵John J. Boswell and Donald W. Mocker, University of Missouri-St. Louis, "VERB" University Extension Courses, Victor Educational Services Institute Report, (1968).

Professor Solon Stone, Assistant to the Dean of Engineering, Oregon State University¹⁶ says, "It is my conviction that the telelecture/VERB combination offers the most economical, flexible and effective way to teaching courses remote from the campus. This combination has met with the approval of the students and myself with only minor modifications necessary to make it almost completely acceptable."

The Northwest Iowa Telewriter Project¹⁷ noted some problems of the Electrowriter which included equipment difficulties and sensitivity of the electrowriter to slight maladjustments and electrical noise. There was some malfunctions in the telephone equipment such as Data Phones and switchboard contact. At times there was interference on the telephone lines. The liquid ink supply required careful handling when machines were moved and keeping the writer pen functional was a problem. Other complaints included: the stationary microphone that prevented reasonable two way communication, the written material on the acetate could not be reversed for review, difficulty of obtaining a noise-free line and telephone operator not familiar with the operation.

¹⁶Solon Stone, Oregon State University, "VERB" University Extension Courses, Victor Educational Services Institute Report, (1968).

¹⁷Arthur C. Anderson, Northwest Iowa Telewriter Project, "Evaluation of The Project", Area District IV-A, Des Moines, Iowa, (1965).

Other problems might be called people problems. To utilize the telewriter efficiently requires extensive and exacting class preparation by the teacher and also more attention is required of the student. The absence of the a reaction was listed as a problem, however impa not substantiate this problem.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

In an evaluation by Texas A & M Univer that an external educational program could be carried out at locations that are too far removed from campus to be otherwise serviced. The apparatus required is relatively easy to operate and to maintain. The major criticisms are two-fold. One of these is the actual operation of the equipment and the other, that of the difficulty of communicating even with good operation. The difficulties in equipment operation are surmountable providing the manufacturing company will cooperate. The communications problem is also easily overcome if the telephone company personnel will exert effort to make the equipment perform as it should.

Dyer¹⁹ indicates both the audio (conference sets providing amplified telephone) and the visual (VERB providing the writing)

¹⁸Edward A. Meyers and Richard M. Hedges, Texas A & M University, "Blackboard by Wire and Graduate Instruction in Chemistry", Journal of Chemical Education, Vol. 44, p 452, (August, 1967).

¹⁹Jimmie B. Dyer, "Telewriter Educational System", Barry County Cooperative Project, pp 42-43 (June, 1969).

are dependent upon the telephone circuits. It is necessary that these telephone circuits provide good channels to carry the signals of the two pieces of equipment. These telephone facilities are expected to be free of interference and provide a signal strength that enables the voice to be amplified with fidelity and the writing to appear true and legible. Dyer also suggested a word of caution to prospective users - make certain there is a complete understanding between hardware, telephone and education people as to the program in mind and the exact needs to implement such from the technical standpoint. Insist on quality service and make sure this is in existence before beginning the instructional program.

Dr. Charles Weaver²⁰, Dean of the School of Engineering, University of Tennessee, feels the introduction of WATS lines was a step in the right direction. He could not justify the cost for normal day time telephone calls but with the addition of telewriter to use for remote teaching in the evening a need was shown for WATS which was easily justified. What is more, the cost of remote teaching is less than the cost of travel, although the real savings are in professor's time.

²⁰Teaching Tools, "Technology Bridges Tennessee's Hills", College Management, pp 54,55-56, (April 1968).

There are fringe benefits too according to Dean Weaver.

"The remote system makes instructors think more about how to teach - it forces them to prepare before the class begins. In short, it isn't difficult for the really good teacher and it points up weaknesses of instructors with poor teaching habits."

Dr. Daw²¹ noted, "Merely attending a telelecture is an educational experience in itself." Another interesting statement indicated the instructor could have all his resources available while teaching, including notes, outlines and texts. Should he be referring to any of these while lecturing, he doesn't distract students on the receiving end because they see only the material he transmits by the electrowriter.

In a recent article by Boulgarides and Filippo²² there are indications of the need for innovations such as telewriter in adult education. These are explained in the following paragraphs:

The McDonnell Douglass Aircraft Company recently queried a random sample of its engineers about their involvement in continuing education and discovered that fifty percent have attended

²¹Harold Daw, "White Sands Missile Range Provides Continuing Education", Telephony, p-30, (September 16, 1967).

²²J. D. Boulgarides and V. C. San Filippo, "Engineers Need Further Education-When Will They Get It?", Industrial Engineering, Vol 1, Number 8, pp 56-57, (August 1969).

some in-plant education/training program, forty percent take college extension courses and one out of four participate in out-of-plant seminars.

It was indicated that out-of-plant programs should be designed to have more value and appeal. This can be accomplished by generating active participation and involvement of the attendees. As the saying goes, "Stop preaching - start teaching." Instead of telling the individual what to do, start asking him what to do and make use of this information as a guideline.

The important thing will be to individualize instructions in order to modify the individual's behavior and enable him to meet the needs of a given employment situation effectively. There may be a need to depart from too rigidly structured programs which are frequently designed more for the convenience of the establishment than for the edification of the participant. Programs should be designed to meet specific needs rather than to meet requirements for credentials. An innovative approach might be in order.

Telewriter is a reality and can be used as an educational media to help meet the needs of people.

IMPLICATIONS

The value of telewriter as a teaching tool has been successfully demonstrated by several institutions. It is used in 30 states, Canada, Australia, England and Scotland. Many factors can be controlled or regulated to some degree. There are some intangibles that will vary according to the particular situation.

For telewriter to be effective as a teaching device, there must be a desire and understanding on the part of all people involved. Attitudes are very important. Experience has indicated that a teacher may pre-determine the outcome of classroom activities simply by showing enthusiasm, knowledge and sensitivity to the job at hand. The reaction of the user to telewriter must be positive if it is to be effective.

Adjusting to the many changes in specific need of our complex society will involve educational innovations. The necessity of effective communications is important to individuals as well as groups. The telewriter system is a media whereby the extension and continuing education effort in Missouri might possibly be enhanced.

The telewriter can be used for single presentations, complete credit courses, staff meetings, conferences, extra-curricular programs or utilized for in-service training programs or simply as a means of individual communication. The use of a

recorder that tapes both audio and video could be another procedure which might aid in the educational process. If each of the area centers taped the presentation, it could then be presented to other audiences at their convenience thereby reaching more people. This could be handled by the local Extension Director just as any audio visual presentation.

Probably one of the problems in utilizing telewriter to its capacity would be convincing our people of its merit. Local responsibility, supervision and initiative is certainly important for the success of this medium.

There is an art to teaching by telewriter. The majority of people could master the technique if they studied, practiced and had the desire. The usual qualities of a good teacher are necessary plus rehearsing under conditions simulating an actual broadcast until they are experienced. The key apparently is preparation.

The receiving audience needs to become oriented to the mechanics and procedures prior to the actual contact. Some studies indicate it is better to allow 5 to 10 minutes of "get acquainted time" whereby the instructor in some way gets his audience participating in two way conversation. This procedure seems to break down the distance barrier and sets the audience reaction to a receptive mood. Studies indicate the face, appearance and other physical characteristics are less important in

teaching than the excellence of the preparation and enthusiasm in teaching the course.

Many of the people who have used the telewriter indicated a very real problem in the area of the telephone industry's failure to realize the critical factors involved in transmission. This was so pronounced that it almost suffocated all desire to continue usage in many cases. Those who kept trying and finally attracted the attention of top executives in the telephone company, surmounted the problems and received excellent service. This would indicate there should be a complete understanding between equipment, telephone and user people as to the program and the exact needs to implement from the technical standpoint. You must insist on quality service and make sure this is in existence before beginning the instructional program.

The University of Missouri has several telewriter units that can be used at the present time (see Table V). You will note the strategic locations. The area concept of field staff services that has been developed by the University of Missouri Extension Division would lend itself well to use of the telewriter system.

The feasibility of a WATS line between the four campuses and each of the area office locations might be explored. If the WATS line or a dedicated line could be used, an effective network could be developed similar to the system in Illinois. It is in

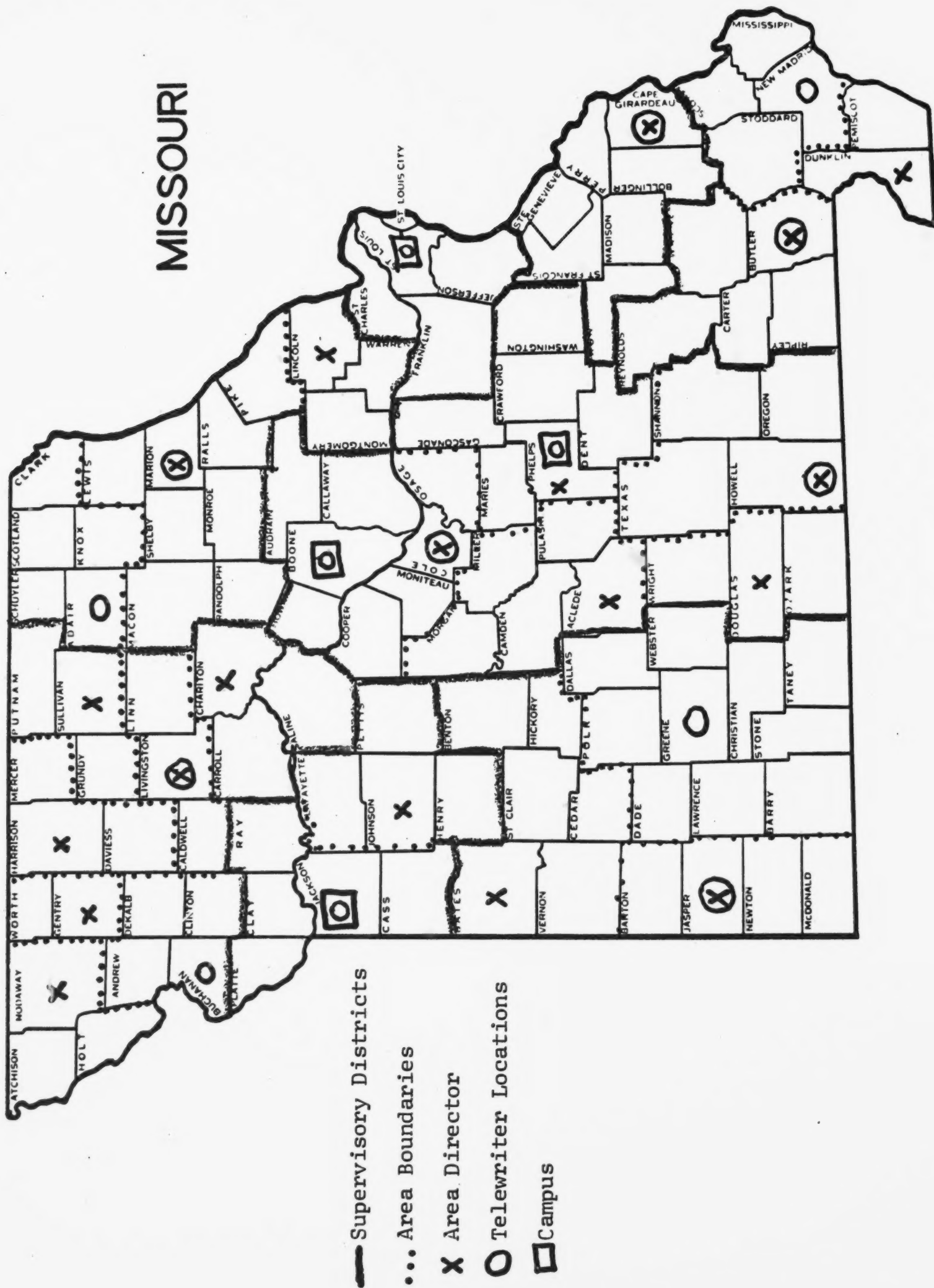
operation 14 hours per day, 5 days a week.

It would be necessary for each area location to have an Educational Control Console that could switch to any location within the particular locality. This would require a "floating" set or sets depending on the number of locations to be serviced simultaneously in each of the areas. This type of educational communications system could be of great value to the people in Missouri.

The Province of Quebec has proven an area network will work for telewriter. They are now in the process of utilizing the lines for CCTV and slow scan television. Missouri might well consider this approach.

There is no magic in telewriter. It is simply a media that can be used to help meet the many challenges of making available opportunities for educational advancement to all people in Missouri.

TABLE V



BIBLIOGRAPHY

Blackwood, Helen and Curtis Trent. "A Comparison of the Effectiveness of Face-to-Face and Remote Teaching in Communicating Educational Information to Adults," Extension Bulletin - 4, Kansas State, Manhattan, November 1968.

Boswell, John J. and Donald W. Mocker. University of Missouri-St. Louis, "VERB: University Extension Courses", Victor Educational Services Institute Report, 1968.

Boulgarides, J. D. and V. C. San Filippo. "Engineers Need Further Education - When Will They Get It?", Industrial Engineering, Volume 1, Number 8 pp 56-57, August, 1969.

C.C.I.C., "VERB-An Innovation for Remote Areas", Carbon County Instructional Center, Volume 1, Number 1, January, 1967.

Daw, Harold. "White Sands Missile Range Provides Continuing Education", Telephony, P-30, September 17, 1967.

Dyer, Jimmie B. "Telewriter Educational System", Barry County Cooperative Projects, June, 1969.

Edelman, Lily. "Teaching Adults Via Telelecture and Electrowriter", Adult Leadership, pp 163,164-189, October, 1968.

Ewbank, H. L. and E. E. Baker. "Telelecture or Traditional Lecture?", Journal of Cooperative Extension, Volume 6, Number 1, Spring, 1968.

Mellinger, William. "Lear Engineers Use Telelecture Link", Communication News, September, 1967.

Meyers, Edward A. and Richard M. Hedges. Texas A & M University, "Blackboard by Wire and Graduate Instruction in Chemistry", Journal of Chemical Education, Volume 44, P 452, August, 1967.

Morton, B. E. and Richard L. Burns. "Telelecture in Industrial Education", Industrial Arts and Vocational Education, LV, p 40, June, 1966.

Morton, Richard. "Telewriter Opens New Doors To In Service Training", Educational Bulletin, Volume 35, Number 3, pp 1-3, November, 1965.

Northwest Iowa Telewriter Project, Arthur C. Anderson, Evaluation of the Project Area District IV-A, Des Moines, Iowa, 1965.

P.A.C.E. Project. "Block Island", American Education II, November, 1966.

Seylers, J. W. Letter dated July 11, 1969 and Report Enclosed.

Stone, Solon. Oregon State University, "VERB: University Extension Courses", Victor Educational Services Institute Report, 1968.

University of Illinois, "Multi-Media In The Division of University Extension, University of Illinois", Report, P-1, 1969.

University of Tennessee, "Technology Bridges Tennessee's Hills," College Management, pp 54,55-56, April, 1968.

Victor Comptometer Corporation. "VERB/Largest System," Attached Brochures, Chicago, Illinois, June, 1968.

Victor Educational Services Institute. VERB University Extension Courses, Chicago, Illinois, 1968.

ERIC Clearinghouse

APR 6 1970

on Adult Education